National Institute of Environmental Health Sciences

A heuristic indication and warning staging model for detection and assessment of biological events

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Abstract:

OBJECTIVE: This paper presents a model designed to enable rapid detection and assessment of biological threats that may require swift intervention by the international public health community. DESIGN: We utilized Strauss' grounded theory to develop an expanded model of social disruption due to biological events based on retrospective and prospective case studies. We then applied this model to the temporal domain and propose a heuristic staging model, the Wilson-Collmann Scale for assessing biological event evolution. MEASUREMENTS: We retrospectively and manually examined hard copy archival local media reports in the native vernacular for three biological events associated with substantial social disruption. The model was then tested prospectively through media harvesting based on keywords corresponding to the model parameters. RESULTS: Our heuristic staging model provides valuable information about the features of a biological event that can be used to determine the level of concern warranted, such as whether the pathogen in question is responding to established public health disease control measures, including the use of antimicrobials or vaccines; whether the public health and medical infrastructure of the country involved is adequate to mount the necessary response; whether the country's officials are providing an appropriate level of information to international public health authorities; and whether the event poses a international threat. The approach is applicable for monitoring open-source (public-domain) media for indications and warnings of such events, and specifically for markers of the social disruption that commonly occur as these events unfold. These indications and warnings can then be used as the basis for staging the biological threat in the same manner that the United States National Weather Service currently uses storm warning models (such as the Saffir-Simpson Hurricane Scale) to detect and assess threatening weather conditions. CONCLUSION: Used as a complement to current epidemiological surveillance methods, our approach could aid global public health officials and national political leaders in responding to biological threats of international public health significance.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2274782

Resource Description

Communication:

resource focus on research or methods on how to communicate or frame issues on climate change; surveys of attitudes, knowledge, beliefs about climate change

A focus of content

Communication Audience: ☑

audience to whom the resource is directed

Health Professional, Policymaker, Public, Researcher

Early Warning System: ☑

resource focus on systems used to warn populations of high temperatures, extreme weather, or other elements of climate change to prevent harm to health

A focus of content

Exposure : ☑

weather or climate related pathway by which climate change affects health

Unspecified Exposure

Geographic Feature: ☑

resource focuses on specific type of geography

None or Unspecified

Geographic Location: ☑

resource focuses on specific location

United States

Health Impact: ☑

specification of health effect or disease related to climate change exposure

General Health Impact, Infectious Disease

Infectious Disease: General Infectious Disease

Intervention: ☑

strategy to prepare for or reduce the impact of climate change on health

A focus of content

Medical Community Engagement: ☑

resource focus on how the medical community discusses or acts to address health impacts of climate change

A focus of content

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation, Mitigation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Methodology, Outcome Change Prediction, Other Projection Model/Methodology

Other Projection Model/Methodology: heuristic staging model

Resource Type: ☑

format or standard characteristic of resource

Research Article, Research Article

Timescale: ☑

time period studied

Short-Term (

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content